BC50I – Box PC for Industrial Applications

- **AMD Embedded G-Series Dual-Core APU**
- **2 Gigabit Ethernet**
- **2 USB 2.0**
- **2 DisplayPort® outputs, full HD with each display**
- **WLAN, GSM (2G), UMTS (3G), LTE (4G), GPS or GLONASS via 1 PCI Express® Mini Card slot**
- **2 Slots for IBIS, GPS, RS232, RS485, RS422**
- **1 CAN Bus interface optional**
- **24 VDC nom. (16 to 36 V)**
- **-40 to +70°C operating temperature**
- **Fanless and maintenance-free design**

The BC50I is a fanless, maintenance-free box computer that has been designed for independent use or as display computer electronics for use in industrial applications, e.g. for machine control, surveillance or commercial vehicles or robotics.

It is powered by an AMD Embedded G-Series APU (Accelerated Processing Unit), the T48N, running at 1.4 GHz. The G-Series combines low-power CPUs and advanced GPUs, in this case an AMD Radeon™ HD 6310, into a single embedded device.

The use of the Embedded G-Series makes for high scalability in CPU (single/dual core) and graphics performance (various Radeon™ GPUs or none at all). The BC50I is equipped with 2 GB of DDR3 SDRAM and offers SD card and mSATA slots. A SATA hard-disk/solid-state drive can be installed within the housing as an option.

The system is designed for fanless operation at temperatures from -40 to +70°C, its special aluminum housing with cooling fins serves as a heat sink for the internal electronics and in this way provides conduction cooling.

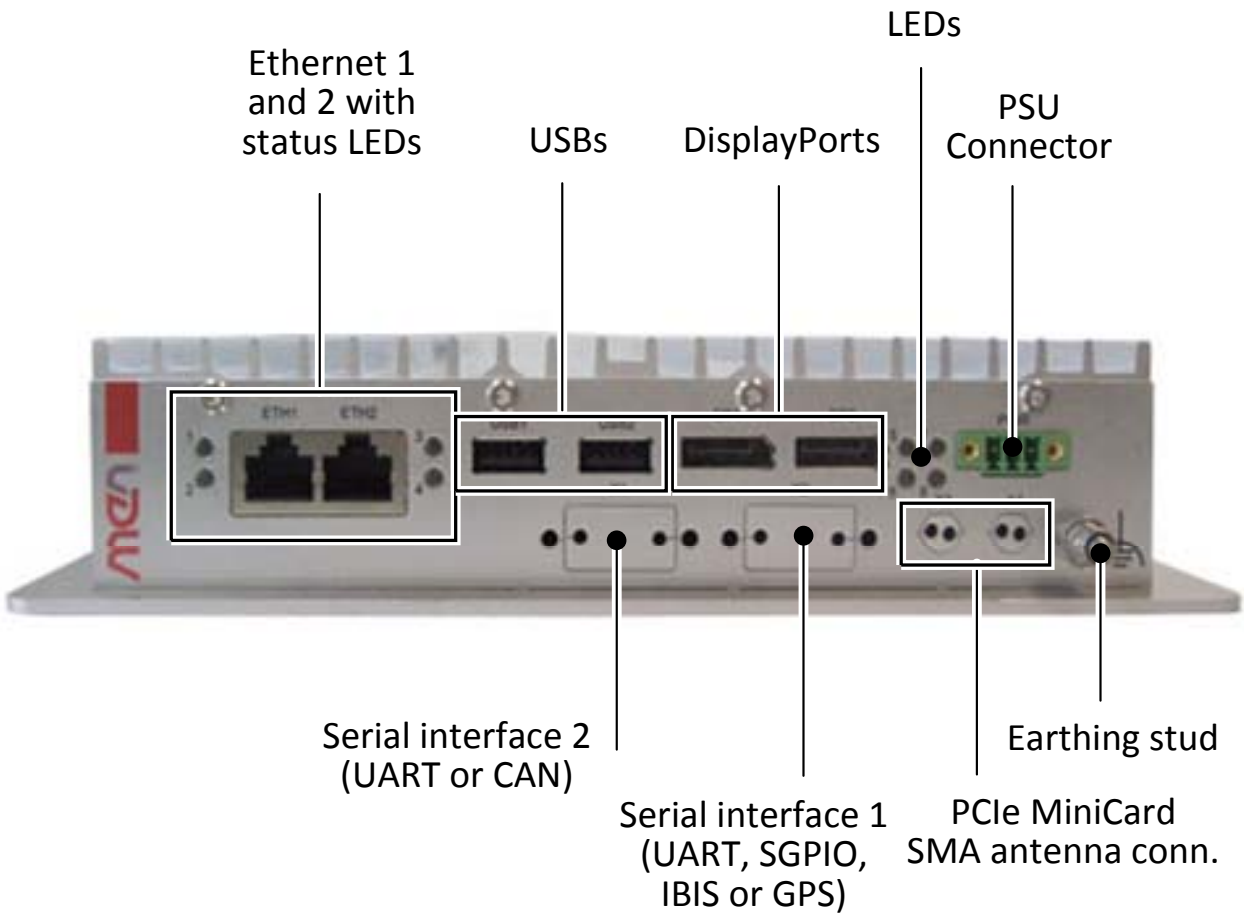
The BC50I supports up to two DisplayPort® interfaces with a maximum resolution of 2560x1600 each. The DisplayPort® interfaces and all other I/O are available at the unit's front panel on standard connectors like USB, 9-pin D-Sub (optional serial I/O), RJ45 (Gigabit Ethernet) and DisplayPort®.

On the inside, the system offers one PCI Express® Mini card slot with a SIM card slot. The necessary antenna connectors can be made available at the front panel.

The BC50I comes with its own integrated 24 VDC nom. (16 to 36 V) power supply.

The combination of the various CPU/GPU options with the available selection of external interfaces (realized via separate graphics and I/O interface boards within the system) makes for an extremely flexible system design that can quickly be tailored to a vast number of applications.

Diagram


LEDs
Ethernet 1 and 2 with status LEDs
USBs
DisplayPorts
PSU Connector
Serial interface 2 (UART or CAN)
Serial interface 1 (UART, SGPIO, IBIS or GPS)
PCIe MiniCard SMA antenna conn.
Earthing stud

Technical Data

CPU	■ AMD Embedded G-Series T48N □ Dual-Core □ 1.4 GHz processor core frequency □ 1066 MT/s DDR3 Speed □ Accelerated Processing Unit (APU), also includes GPU (see Graphics)
Controller Hub	■ AMD A55E
Memory	■ 64 KB L1 and 512 KB L2 cache ■ 2 GB DDR3 SDRAM system memory □ Soldered
Mass Storage	■ One SD card slot □ Via USB ■ One mSATA slot □ SATA Revision 3.x support □ Transfer rates up to 600 MB/s (6 Gbit/s) ■ Serial ATA (SATA) □ One port for hard-disk/solid-state drive mounted within the unit's housing □ SATA Revision 3.x support □ Transfer rates up to 600 MB/s (6 Gbit/s)
Graphics	■ AMD Radeon™ HD 6310 □ Dual independent display support □ Dual DisplayPort® □ Maximum resolution: 2560x1600 □ Embedded in T48N APU ■ 3D Graphics Acceleration □ Full DirectX® 11 support, including full speed 32-bit floating point per component operations □ Shader Model 5 □ OpenCL™ 1.1 support □ OpenGL® 4.0 support ■ Motion Video Acceleration □ Dedicated hardware (UVD 3) for H.264, VC-1 and MPEG2 decoding □ HD HQV and SD HQV support: noise removal, detail enhancement, color enhancement, cadence detection, sharpness, and advanced de-interlacing □ Super up-conversion for SD to HD resolutions
Front I/O	■ 2 DisplayPort® 1.1a interfaces □ AUX channels and hot plug detection ■ 2 Gigabit Ethernet □ Via RJ45 connectors ■ 2 USB 2.0 □ Via Series A connector ■ 2 SA-Adapter slots for serial I/O □ RS232, RS485, RS422, IBIS or GPS possible on both slots □ SGPIO switchable by software on one slot □ CAN bus optional on one slot ■ 8 LEDs □ 4 for Ethernet link and activity status □ 2 user LEDs □ 1 status LED □ 1 power OK LED
1 PCI Express® Mini Card slot	■ For functions such as □ Mobile service standards: GSM (2G), UMTS (3G), LTE (4G) and derivates □ Wireless communication: WLAN / WiFi IEEE 802.11 and derivates □ Positioning: GPS, GLONASS, GALILEO ■ 1 SIM card slot ■ PCI Express® and USB interface

Technical Data

Real-Time Clock	■ Buffered by Gold Cap for up to 12 h □ 72 h as an option
Electrical Specifications	■ Supply voltage: □ 24 VDC nom. (16 to 36 V) ■ Power consumption: up to 35 W (with PCI Express® Mini Card)
Mechanical Specifications	■ Dimensions: approx. 250 mm x 220 mm x 44.1 mm ■ Weight: 1.8 kg ■ Front protected according to IP20
Environmental Specifications	■ Temperature range (operation): □ -40°C to 70°C □ Fanless operation ■ Temperature range (storage): -40..+85°C ■ Relative humidity (operation): max. 95% non-condensing ■ Relative humidity (storage): max. 95% non-condensing ■ Altitude: -300 m to +3,000 m ■ Shock: 50 m/s², 30 ms ■ Vibration (function): 1 m/s², 5 Hz - 150 Hz ■ Vibration (lifetime): 7.9 m/s², 5 Hz - 150 Hz ■ Conformal coating of internal components on request
MTBF	■ tbd @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers
EMC	■ Conforming to EN 55022 (radio disturbance), IEC 61000-4-2 (ESD) and IEC 61000-4-4 (burst)
BIOS	■ InsydeH2O™ UEFI Framework
Software Support	■ Windows® 7 ■ Windows® Embedded Standard 7 ■ Windows® XP Embedded ■ Linux ■ For more information on supported operating system versions and drivers see Downloads.

Configuration & Options

Standard Configurations

Article No.	APU	Graphics	Memory	Input Voltage	Antenna Connectors	SATA HDD/SSD
09BC50I00	AMD T48N, 1.4 GHz Dual Core (18W)	AMD Radeon HD 6310	2 GB DDR3-1066, 64KB L1 cache, 512kB L2 cache	24 VDC nom.	No	No

Options

APU	■ AMD T56N, 1.65 GHz Dual Core, 18W, AMD Radeon™ HD 6320 ■ AMD T56E, 1.65 GHz Dual Core, 18W, AMD RadeonT HD 6250 ■ AMD T48N, 1.4 GHz Dual Core, 18W, AMD Radeon™ HD 6310 ■ AMD T48E, 1.4 GHz Dual Core, 18W, AMD RadeonT HD 6250 ■ AMD T40N, 1.0 GHz Dual Core, 9W, AMD Radeon™ HD 6290 ■ AMD T40E, 1.0 GHz Dual Core, 6.4W, AMD Radeon™ HD 6250 ■ AMD T52R, 1.5 GHz Single Core, 18W, AMD Radeon™ HD 6310 ■ AMD T44R, 1.2 GHz Single Core, 9W, AMD Radeon™ HD 6250 ■ AMD T40R, 1.0 GHz Single Core, 5.5W, AMD Radeon™ HD 6250 ■ AMD T16R, 615 MHz Single Core, 4.5W, AMD Radeon™ HD 6250 ■ AMD T48L, 1.4 GHz Dual Core, 18W ■ AMD T30L, 1.4 GHz Single Core, 18W ■ AMD T24L, 1000 MHz Single Core, 5W
Memory	■ Up to 4 GB DDR3 SDRAM system memory ■ SATA hard-disk/solid state drive (mounted within housing)
Graphics	■ Maximum resolution depending on GPU □ 2560x1600 (all DisplayPort® interfaces) with Radeon™ HD 6310 and 6320 □ 1920x1200 (all DisplayPort® interfaces) with Radeon™ HD 6250 and 6290
I/O	■ Antenna connectors □ For functions like Wi-Fi, WIMAX, GSM/GPRS, UMTS, LTE in combination with PCI Express® Mini Card □ Reverse SMA connector
Environmental Specifications	■ Temperature range (operation): □ -40°C to 85°C (screened) with wider housing with additional cooling fins

As the product concept is very flexible, there are many other configuration possibilities. Please contact our sales team if you do not find your required function in the options. Please note that some of these options may only be available for large volumes.

Ordering Information

Standard BC50I Models	**09BC50I00**	Industrial box computer with dual graphics connection, 24 VDC PSU, AMD Dual Core T48N, 1.4 GHz, 2 GB RAM, SD card slot, mSATA slot, 2x DisplayPort®, 2x Gb Ethernet RJ45, 2x USB, 2x SA-Adapter slot (UARTs, fieldbuses), 1x PCI Express® Mini card slot, 1x SIM card slot, -40..+70°C screened
Related Hardware	**15PX01-00**	GLONASS & GPS PCI Express® MiniCard (full size), 3-axis Gyro sensor, -40..+85°C with qualified components
	15PX04-00	Audio interface for mobile wireless cards, with SIM card holder, -40..+85°C screened
Memory	**0751-0047**	SD card, 4GB, -40..+85°C
	0751-0051	SSD mSATA, 8 GB, -40..+85°C
SA-Adapters	**08SA01-06**	RS232, not optically isolated, -40..+85°C screened
	08SA02-07	RS422/485, full duplex, optically isolated, -40..+85°C screened
	08SA03-01	1 RS232, optically isolated, -40..+85°C screened
	08SA08-01	CAN ISO high-speed, optically isolated, -40..+85°C screened
	08SA15-00	8 digital I/O channels, -40..+85°C with qualified components, no RoHS
	08SA22-00	IBIS master SA-Adapter, -40..+85°C screened
	08SA22-01	IBIS slave SA-Adapter, -40..+85°C screened
Miscellaneous Accessories	**05BC01-00**	19" insertion frame for Box PCs including 2 heat sinks More info
	0780-0005	DisplayPort® to DVI-D adapter, 20 cm
	0780-0006	Active DisplayPort® (DP) to single link DVI-D adapter, 20cm, max. resolution 1920x1200, AMD / ATI Eyefinity technology
	0781-0002	HF antenna cable with U.FL connector to RP-SMA connector, 200 mm
	0799-0003	UMTS PCIe® Mini Card GTM661W, half-size card with adapter for full-size slot, -10° C..+55°C operating temperature, -40°C..+85°C storage temperature Note: when using wireless modules the R&TTE Guide of the EU has to be observed. See the R&TTE website For the module's driver see Option's website
	0799-0004	WLAN PCIe® MiniCard (Intel® Centrino Advanced-N 6205), 802.11n 2x2 MIMO, 2.4 GHz and 5 GHz, half-size card with adapter for full-size slot, operating temperature 0°C..+80° C, storage temperature -40°..+85°C Note: when using wireless modules the R&TTE Guide of the EU has to be observed. See the R&TTE website For the module's driver see the Intel® website

Ordering Information

Software: Linux

This product is designed to work under Linux. See below for potentially available separate software packages from MEN.

13SC24-90	Linux I2C controller driver (MEN) for SC24, AE51, BC50M, BC50I and BL50W
13SC24-91	Linux tool (MEN) for UART mode setting for SC24, BC50M, BC50I and BL50W
13T026-90	Linux GPU and chipset driver (AMD) for BC50M, BC50I, BL50W, SC24 and G214
13Y004-06	MDIS5 low-level driver sources (MEN) for generic SMBus driver for F14, F15, F17, F18, F19P, F21P, F22P, G20, G22, D9, D601, F600 and F601, A19, A20, F217, SC24, BC50M, BC50I and BL50W
13Z010-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for 16Z076_QSPI
13Z015-06	MDIS5 low-level driver sources (MEN) for 16Z029_CAN (MSCAN/Layer2)
13Z016-06	MDIS5 driver (MEN) for 16Z029_CAN (CANopen master)
13Z017-06	MDIS5 low-level driver sources (MEN) for 16Z034_GPIO, 16Z037_GPIO and 16Z127_GPIO

Software: Windows®

This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.

10F014-78	Windows® XP Embedded BSP (MEN) for F11S, F14, F15, F17, F18, F19P, F21P, G20, XM1, XM1L, XM2, MM1, MM2, SC21, SC24, DC1, DC2, RC1, BC50I, BC50M and BL50W
10Y000-78	Windows® Embedded Standard 7 BSP for F11S, F19P, F21P, F22P, F75P, G20, G22, XM1L, XM2, MM1, MM2, SC21, SC24, SC27, BC50M, BC50I, BL50W, BL50S, DC13, F206, F210, F215, F216, G215, P506, P507 and P511
13SC24-77	Windows® Installset (MEN) for SC24, BC50M, BC50I and BL50W (Includes all free drivers developed by MEN for the supported hardware.)
13T010-70	Windows® 32-bit network driver (Intel®) for XM1, XM1L, XM2, MM2, F11S, F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, G211, G211F, SC24, BC50I, BC50M and BL50W
13T020-70	Windows® 64-bit network driver (Intel®) for F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, G211, G211F, XM2, SC24, BC50I, BC50M and BL50W
13T025-70	Windows® XP GPU and chipset driver (AMD) for BC50M, BC50I, BL50W and SC24
13T026-70	Windows® Vista™ / Windows® 7 GPU and chipset driver (AMD) for BC50M, BC50I, BL50W, SC24 and G214
13Z010-70	MDIS5 Windows® driver (MEN) for 16Z076_QSPI devices
13Z015-70	MDIS4/2004 / MDIS5 Windows® driver (MEN) for 16Z029_CAN (MSCAN/Layer2)
13Z016-70	MDIS5 Windows® driver (MEN) for 16Z029_CAN (CANopen master)
13Z017-70	MDIS4/2004 / MDIS5 Windows® driver (MEN) for 16Z034_GPIO devices

For operating systems not mentioned here contact MEN sales.

Documentation

Compare Chart Standard and Custom Box PCs » Download

20BC50I00	BC50I User Manual
20BC50IER	BC50I Errata

Contact Information

Germany

MEN Mikro Elektronik GmbH
Neuwieder Straße 3-7
90411 Nuremberg
Phone +49-911-99 33 5-0
Fax +49-911-99 33 5-901

info@men.de
www.men.de

France

MEN Mikro Elektronik SAS
18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33 (0) 450-955-312
Fax +33 (0) 450-955-211

info@men-france.fr
www.men-france.fr

USA

MEN Micro Inc.
860 Penllyn Blue Bell Pike
Blue Bell, PA 19422
Phone (215) 542-9575
Fax (215) 542-9577

sales@menmicro.com
www.menmicro.com

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